Dell™ PowerVault™ Configuration Guide for VMware ESX/ESXi 3.5

Version 1.0

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Dell Virtualization Solutions Engineering
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1. Introduction

This document describes configuration steps to deploy solutions with VMware ESX/ESXi 3.5 on Dell™ PowerVault™ MD3000i, NX1950, MD3000, and MD1000. VMware ESX/ESXi 3.5 will be referred to as ESX for the remainder of the document. If any provision is related specifically to only ESX 3.5 or ESXi 3.5, it will be explicitly stated.

2. Support Matrix

This section describes supported ESX software and ESX features.

PowerVault Storage Device	Supported VMware software	Maximum ESX host supported	VMotion Support?	VMware HA Support?	Support Notes
MD1000	ESX 3.5	1	No	No	
MD3000	ESX 3.5 ESXi 3.5	4	No	No	
MD3000i	ESX 3.5 ESXi 3.5	16	Yes	Yes	
NX1950	ESX 3.5 ESXi 3.5	16	Yes	No	Not supported in Integrated High Availability Configuration. Only iSCSI protocol is supported. NAS is not supported. SAN Gateway is not supported.

Section 1: Dell iSCSI Storage Arrays

3. MD3000i Introduction

The Dell™ PowerVault™ MD3000i storage solution can enable either a standard or high availability configuration. The standard model has a single controller with two 1GbE iSCSI ports. It can be deployed to support up to 16 hosts non-redundantly. The high availability model has dual controllers with two 1GbE iSCSI per controller for a total of four 1GbE ports. The dual controller option can connect up to 16 fully redundant hosts. Each MD3000i controller also contains an Ethernet port (not an iSCSI port) for out-of-band management.

Provisioning of storage on servers in a VM environment is a multiple step process starting with definition of the server names for host access. The iSCSI connection is then established from the storage subsystem, and after detection and configuration is established as a two way link with the associated ESX server(s), completing the iSCSI communication subsystem. The final step allocates the detected storage to the individual virtual machines (VM's), where all or part of the configured storage can be assigned to individual VM's.

Note: NIC teaming is supported by the MD3000i only with VMware ESX/ESXi 3.5. The MD3000i does not support NIC teaming with other operating systems.

Note: All NICs in a vSwitch must be in the same broadcast domain. If you connect the NICs directly to the MD3000i, they will not be accessible on a broadcast.

4. MD3000i Reference Solution

The following configurations illustrate recommended deployment for the MD3000i with ESX.

4.1 Up to 16 SAN-Configured Servers, Redundant Data Path, Dual Controllers (Duplex)

In this configuration, up to 16 VMware ESX servers are connected to the MD3000i via two dedicated Ethernet switches. On each server, a Virtual NIC Team is created with one NIC connected to Ethernet switch 1 and a second NIC is connected to Ethernet switch 2. Controller ports 0-0 and 1-0 are connected Ethernet switch1, while controller ports 0-1 and 1-1 are connected Ethernet switch2. A third NIC, not a member of the team, is connected to a management network with one link from the management network going into each controller's management port. Up to two additional MD1000 enclosures can be daisy-chained to the MD3000i.

MD3000i: *Up to 16 ESX Servers, Dual-Path Data, Dual Controllers (Duplex)*

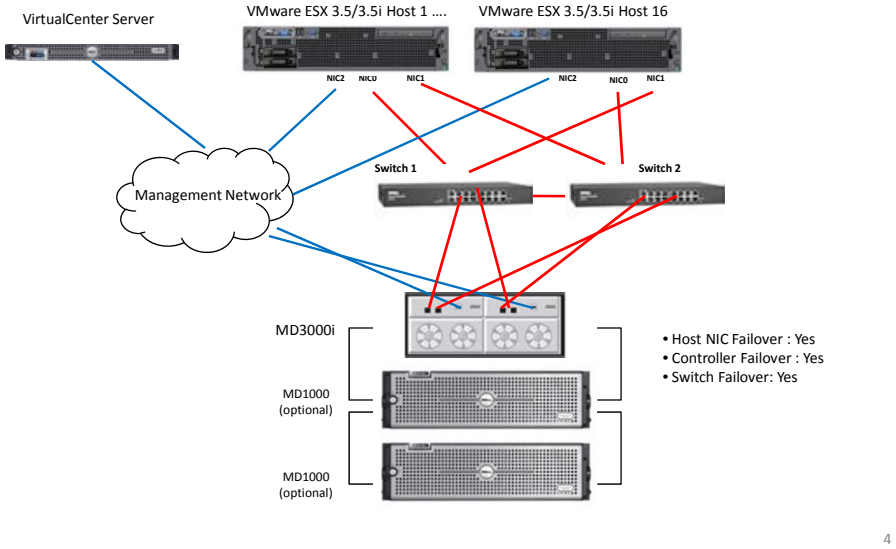


Figure 1a: Up to 16 ESX Servers, Dual-Path Data, Dual Controllers (Duplex)
Note: Switches are trunked or ISL'ed together and all devices are in the same broadcast domain.

MD3000i: *Up to 16 ESX Servers, Dual-Path Data, Dual Controllers (Duplex)*

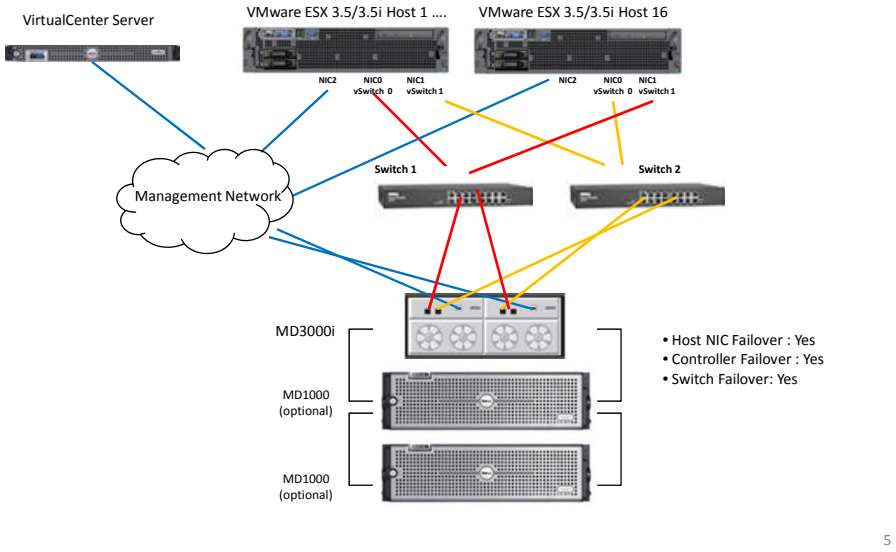


Figure 1b: Up to 16 ESX Servers, Dual-Path Data, Dual Controllers (Duplex)
Note: Each NIC is assigned to different vSwitches. The switches and the NICs are in different subnets. The switches are not trunked or ISL'ed.

4.2 Up to 16 ESX Servers, Dual-Path Data, Single Controller (Simplex)

In this configuration, up to 16 VMware ESX servers are connected to the MD3000i via two dedicated Ethernet switches. On each server, a Virtual NIC Team is created with one NIC connected to Ethernet switch 1 and a second NIC is connected to Ethernet switch 2. Controller port 0-0 is connected to Ethernet switch 1 while controller port 0-1 is connected to Ethernet switch2. A third NIC, not a member of the team, is connected to a management network with one link from the management network going into the controller's management port. Up to two additional MD1000 enclosures can be daisy-chained to the MD3000i.

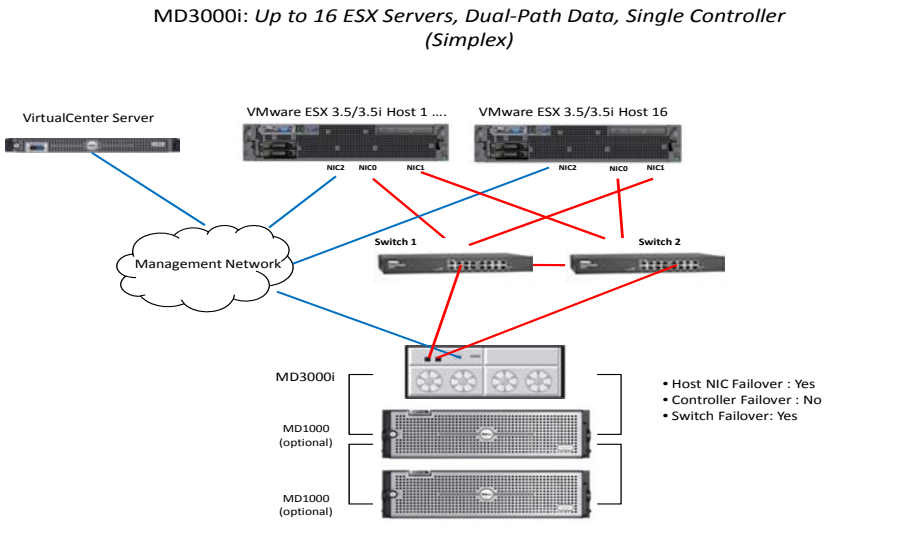


Figure 2: Up to 16 ESX Servers, Dual-Path Data, Single Controller (Simplex)

5. MD3000i iSCSI Software Initiator Configuration

This section lists the steps required to configure the software initiator on the VMware ESX/ESXi 3.5.

5.1 Setting up the NIC

For more information, please refer to VMware's configuration document:
http://www.vmware.com/pdf/vi3_35/esx_3/r35/vi3_35_25_iscsi_san_cfg.pdf

5.2 Completing the Connection between the MD3000i and ESX Host

Connect to the ESX/ESXi 3.5 Server using VI Client, and follow the below steps.

NOTE: If you are using ESXi 3.5, skip to step 4.

1. Select *Configuration->Security Profile* on the ESX server.

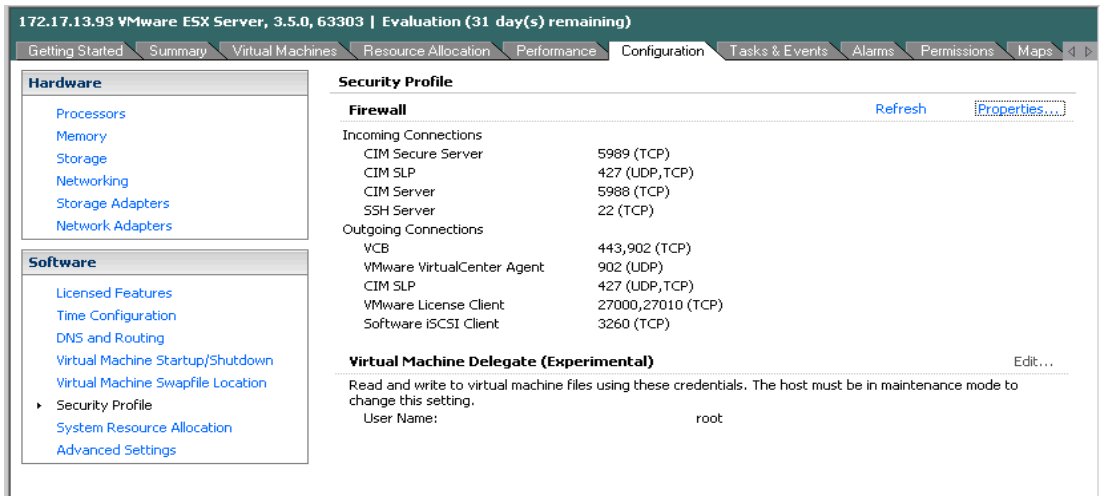


Figure 3: Security Profile Configuration Tab

2. Click on *Properties*. The *Firewall Properties* box appears.

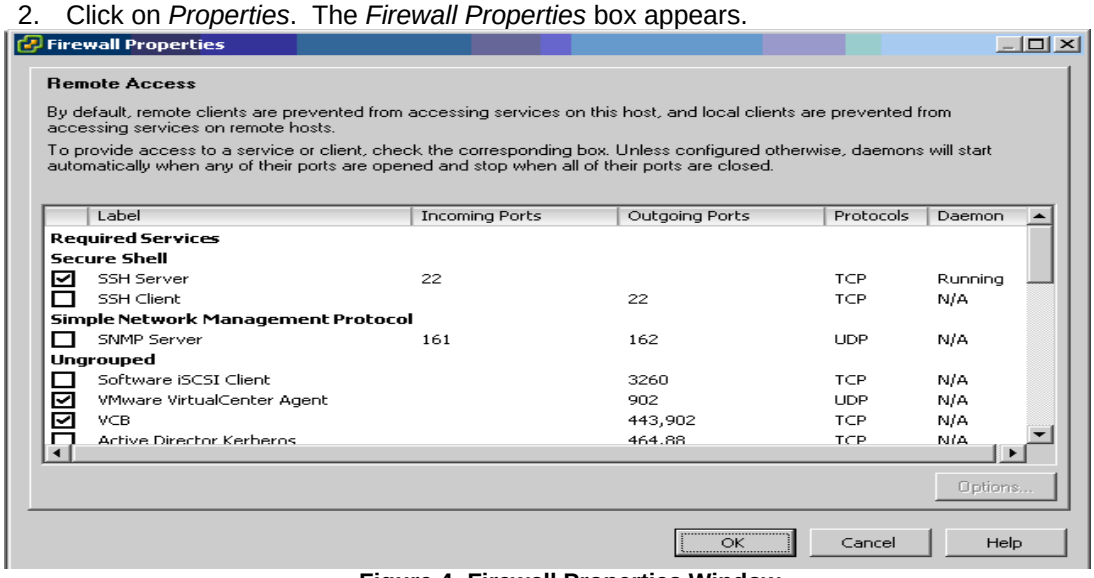

Firewall Properties
Remote Access
By default, remote clients are prevented from accessing services on this host, and local clients are prevented from accessing services on remote hosts.
To provide access to a service or client, check the corresponding box. Unless configured otherwise, daemons will start automatically when any of their ports are opened and stop when all of their ports are closed.
Label
Incoming Ports
Outgoing Ports
Protocols
Daemon
Required Services
Secure Shell
SSH Server 22 TCP Running
SSH Client 22 TCP N/A
Simple Network Management Protocol
SNMP Server 161 162 UDP N/A
Ungrouped
Software iSCSI Client 3260 TCP N/A
VMware VirtualCenter Agent 902 UDP N/A
VCB 443,902 TCP N/A
Active Director Kerberos 464,88 TCP N/A
Options...
OK
Cancel
Help

Figure 4: Firewall Properties Window

3. Check *Software iSCSI Client*.
4. Select *Configuration->Storage Adapters* on the ESX server.
5. Select iSCSI software adapter and click on *Properties.*

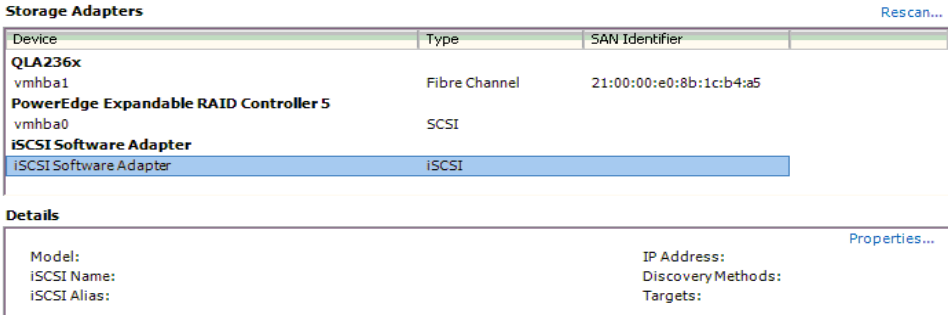


Figure 5: iSCSI software adapter under Storage Adapters on VI client

6. The iSCSI initiator Properties window appears.

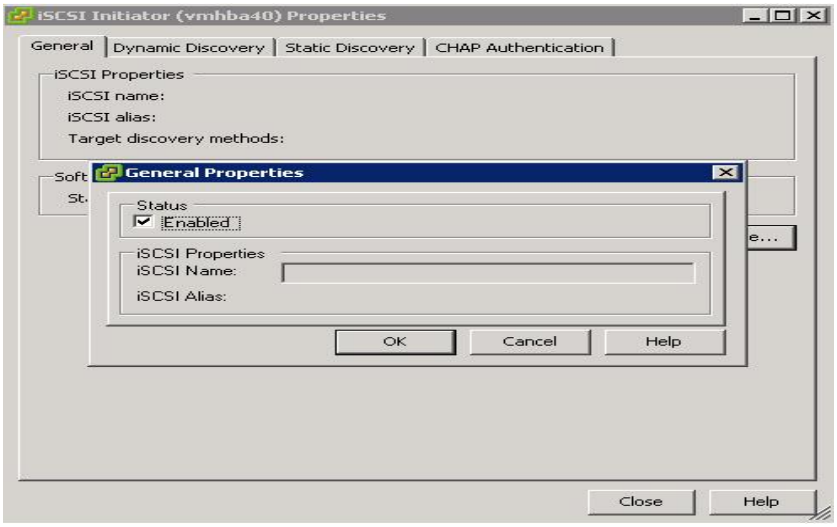
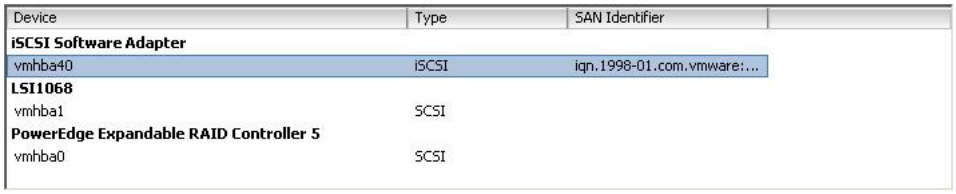


Figure 6: iSCSI software initiator properties window

7. Under the general tab select Configure tab. Select the *Enabled* checkbox and click *OK*. Select Close.

8. Select iSCSI software adapter under storage. You should now see your iSCSI initiator name listed. Please note the name as it is required in a later step.



Device	Type	SAN Identifier
iSCSI Software Adapter		
vmhba40	iSCSI	iqn.1998-01.com.vmware:...
LSI1068		
vmhba1	SCSI	
PowerEdge Expandable RAID Controller 5		
vmhba0	SCSI	

Figure 7: iSCSI software adapter after initial configuration

9. Select Properties under storage adapters. Select Dynamic Discovery. Select *Add*. Provide the IP address of the MD3000i and click OK. There may be a slight delay before the process completes.

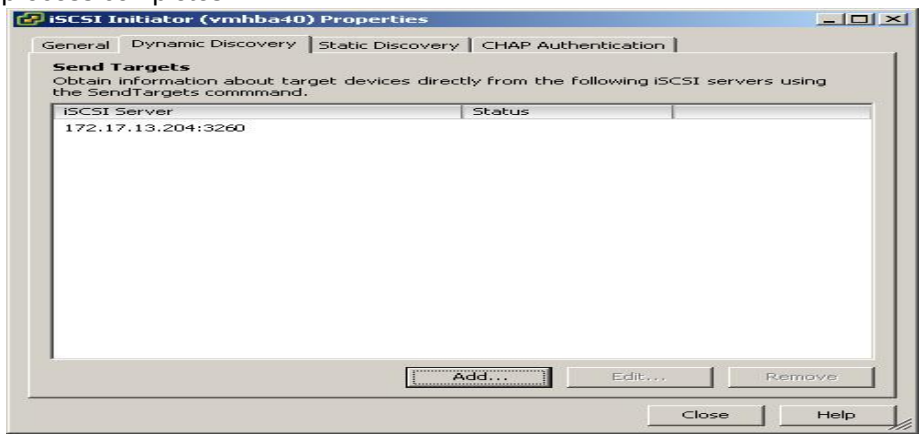


Figure 8: iSCSI software initiator properties window

10. Click *Close*.

6. MD3000i Storage Setup and Configuration

After opening the **Modular Disk Storage Manager** and selecting the MD3000i storage array to be configured, select the *Configure* tab.

> **NOTE:** in the examples to follow the Storage array "sg23_training" is an MD3000i with virtual disks already configured using the Create Virtual Disks selection. The new server being added to an existing host group is named "Valhalla".

Host Group configuration starts from the following screen titled "Configure Host Access (Manual) – Specify Host Group". For ESX servers supporting VMotion, HA, and DRS, a host group must be defined so the MD3000i storage subsystem has a configured iSCSI path to each of the hosts.

- Select "Yes: This host will share access to the same virtual disks with other hosts"
- If a new host group is desired select the radio button for that option and enter in a name for your host group using standard host naming conventions (e.g. no spaces etc).
- Should you already have one or more host groups assigned, select the radio button enabling selection from a drop down list of existing host groups. This option is to be used when configuring the second, third, etc. host in a group. Once the host group is selected previously configured hosts for that host group will be displayed.

NOTE: These are shown as Linux hosts even though they are configured as ESX servers.

Selecting *Next* provides a Confirmation screen in which the new server being configured is shown and the other previously configured associated hosts are named. For the first server configured in a new host group there will be no associated hosts listed under the *Associated host group*.

From the Configure tab

1. Select *Configure Host Access (Manual)*.
2. Enter the host name for the server which has the ESX Server software is installed.
3. Select *Linux* as the host type.

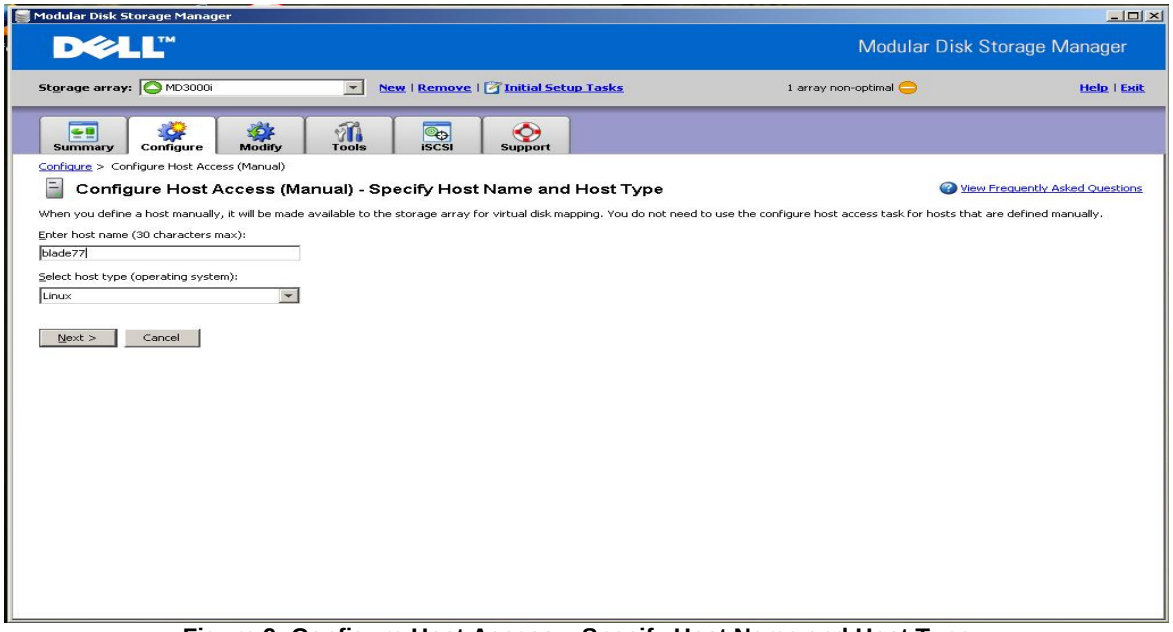

Modular Disk Storage Manager
DELL
Modular Disk Storage Manager
Storage array: MD3000i
New | Remove | Initial Setup Tasks
1 array non-optimal
Help | Exit
Summary
Configure
Modify
Tools
iSCSI
Support
Configure > Configure Host Access (Manual)
Configure Host Access (Manual) - Specify Host Name and Host Type
View Frequently Asked Questions
When you define a host manually, it will be made available to the storage array for virtual disk mapping. You do not need to use the configure host access task for hosts that are defined manually.
Enter host name (30 characters max):
blade77
Select host type (operating system):
Linux
Next >
Cancel

Figure 9: Configure Host Access – Specify Host Name and Host Type

Note: If you are using MD3000i controller firmware that is earlier than Dell Version A02 version 06.70.15.60, then you are limited to 31 characters for the iSCSI alias. ESX generates the iSCSI alias from the FQDN of the ESX server. As best practice, always update to the latest A-rev firmware. If you are using A02 or later firmware, you will not have the 31 character limitation.

To find your controller firmware version, click on the support tab in MDSM. Then, click on View Storage Array Profile. On the Summary tab, scroll down until you find firmware version.

4. Click on your iSCSI initiator and click *Add* to place into Selected iSCSI initiators.

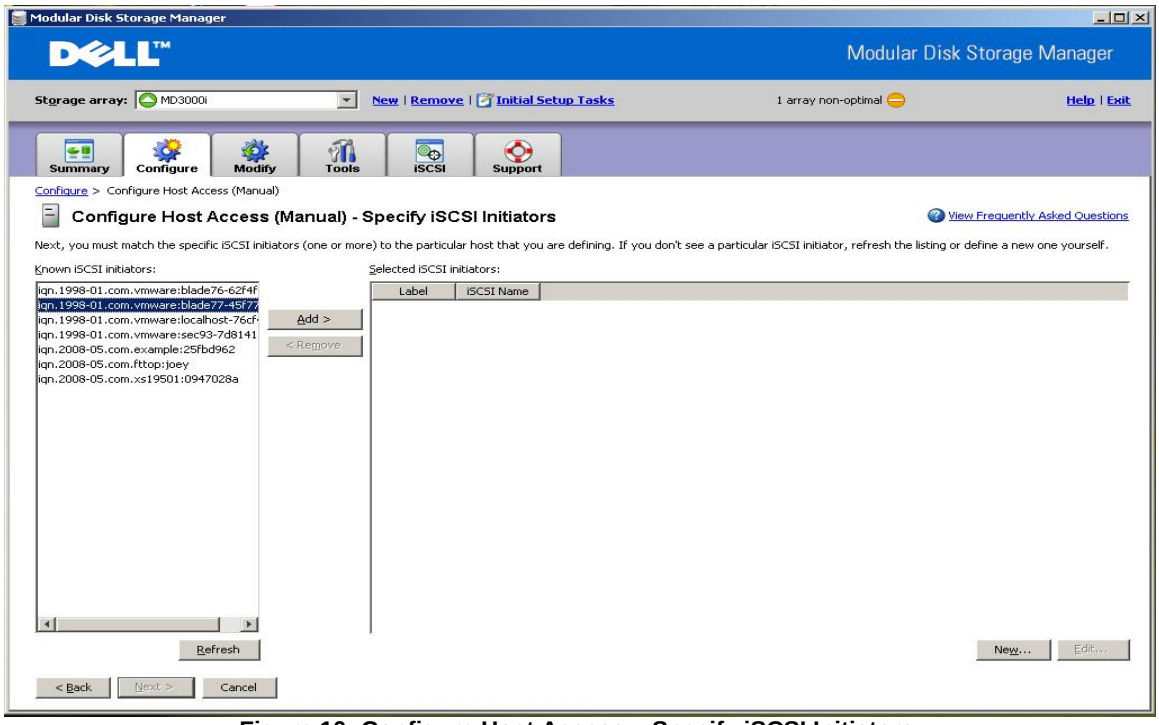


Figure 10: Configure Host Access – Specify iSCSI Initiators

Note: If there is connectivity between the ESX server and the MD3000i and after performing the steps above, the iSCSI initiator for the ESX server should be in the left hand column of the MDSM page. If it is not seen, click *Refresh* button. If you do not see the iSCSI initiator after refreshing, then basic connectivity between the ESX server and MD3000i should be tested.

To test basic connectivity, enable 'ICMP Ping response' in the *iSCSI>Configure iSCSI Host Ports* page of MDSM and attempt to ping.

5. Click *Next*.

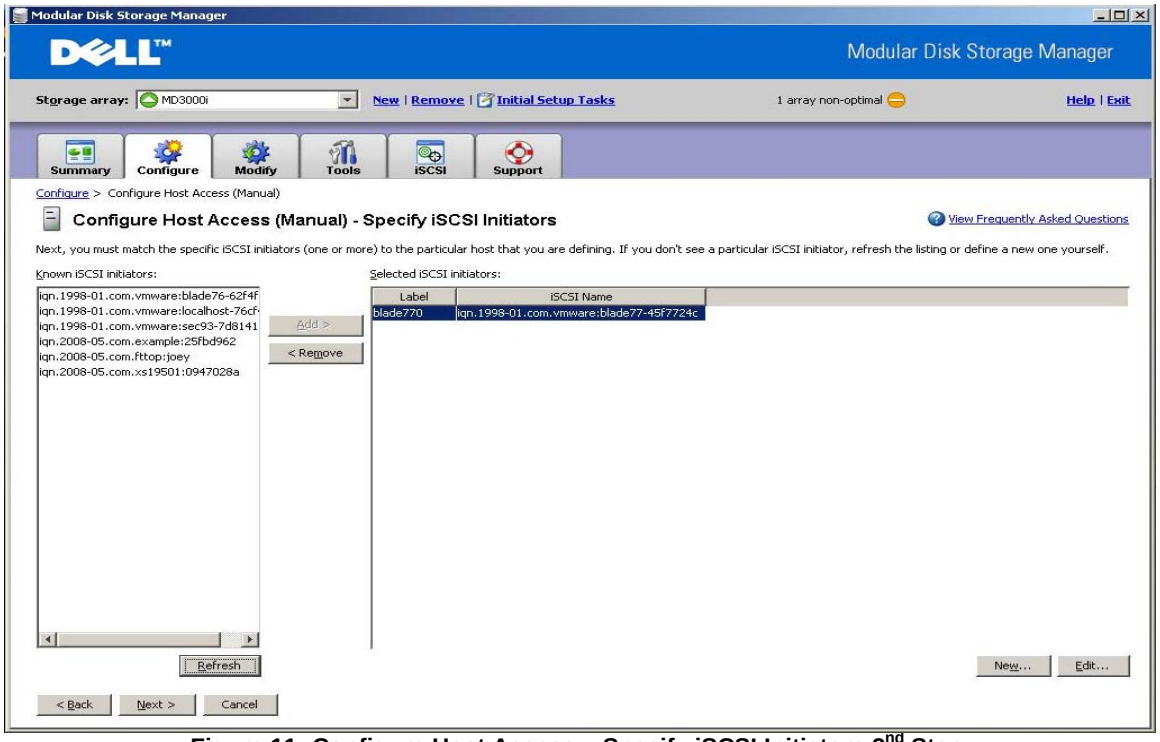


Figure 11: Configure Host Access – Specify iSCSI Initiators 2nd Step

6. Specify the Host Group that the ESX server host will access to its virtual disks.

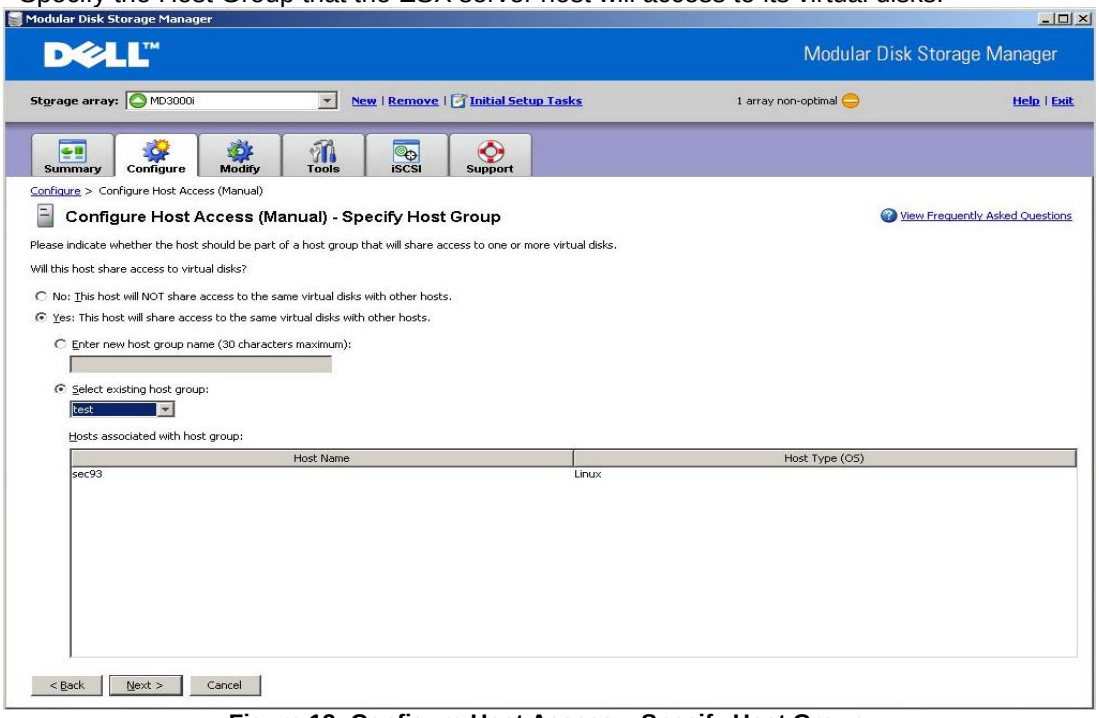

Modular Disk Storage Manager
Modular Disk Storage Manager
Storage array: MD3000i
New | Remove | Initial Setup Tasks
1 array non-optimal
Help | Exit
Summary
Configure
Modify
Tools
iSCSI
Support
Configure > Configure Host Access (Manual)
Configure Host Access (Manual) - Specify Host Group
View Frequently Asked Questions
Please indicate whether the host should be part of a host group that will share access to one or more virtual disks.
Will this host share access to virtual disks?
No: This host will NOT share access to the same virtual disks with other hosts.
Yes: This host will share access to the same virtual disks with other hosts.
Enter new host group name (30 characters maximum):
Select existing host group:
test
Hosts associated with host group:
Host Name
Host Type (OS)
sec93
Linux
< Back
Next >
Cancel

Figure 12: Configure Host Access – Specify Host Group

7. The host confirmation screen appears.

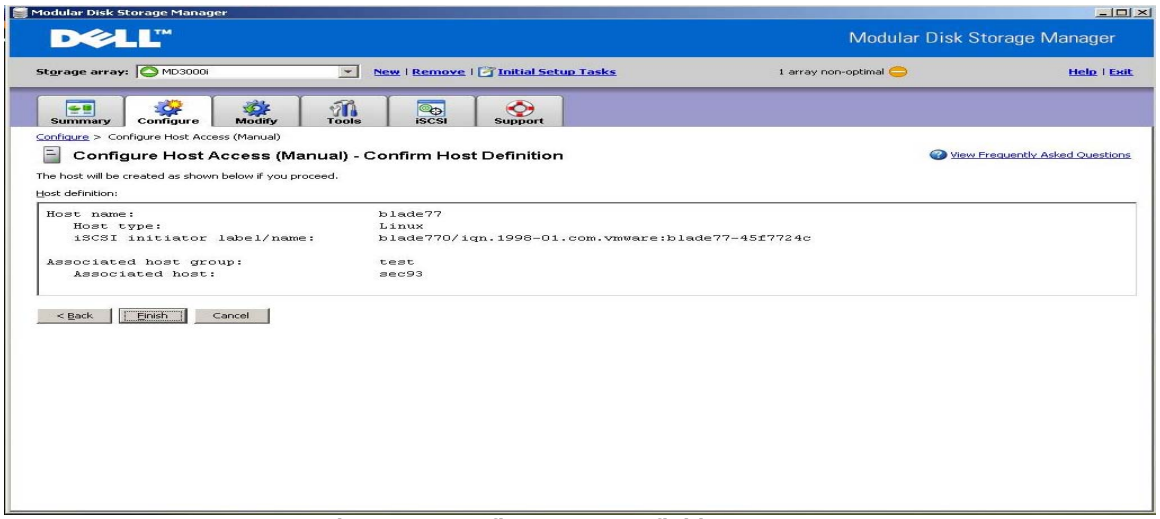


Figure 13: Configure Host Definition

8. Click Finish to complete. This initiates the wizard configuration of the new host.

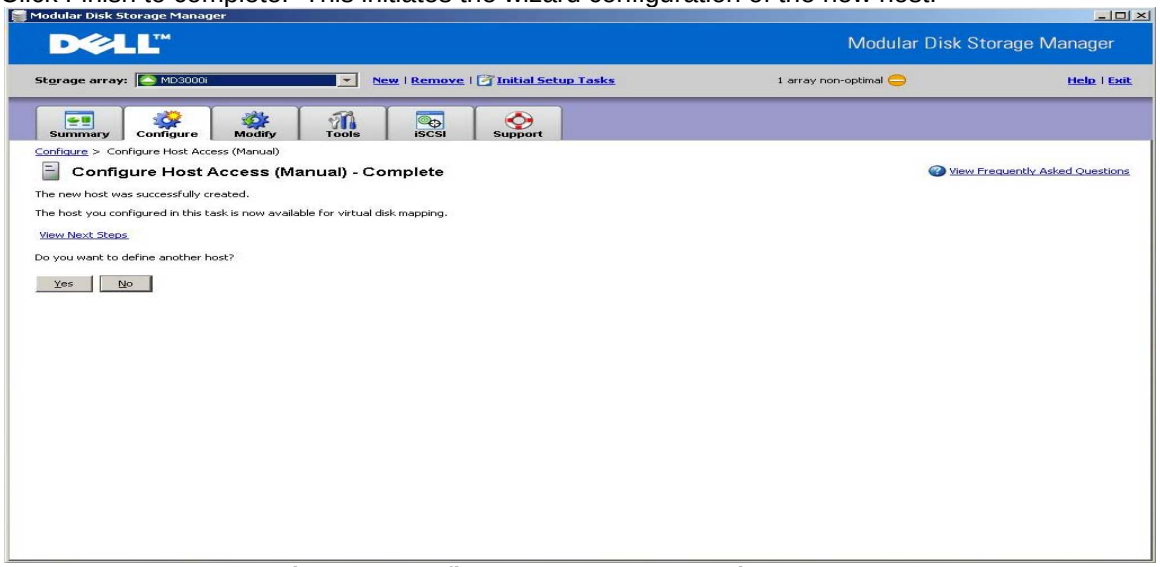


Figure 14: Configure Host Access Complete

On completion,

- Select *Yes* to proceed to the next host you wish to configure, or
- Select *No* to end the configuration wizard.

Next, create virtual disks on the MD3000i using the steps described in the User's Guide at: http://support.dell.com/support/edocs/systems/md3000i/.

Then, assign the LUNs to a host or host groups.

1. If you want to group individual hosts, in MDSM, click on the Configure tab. Otherwise, go to step 3.
2. Click on Create Host Group and add the hosts that you would like to have shared access to the same virtual disks.
3. From the Configure tab, click on Create Host-to-Virtual Disk Mappings.
4. Click on the host or host group that you want to map to a LUN and click Next.
5. Select the virtual disk that you want that host or host group to have access to.

6. Click Finish. On the following pop-up window, click complete.

You now have LUNs that are ready for use with ESX/ESXi.

7. Configure MD3000i Storage on ESX/ESXi

Connect to the ESX/ESXi server/Virtual Center using VI Client and follow the steps below.

1. Go to the configuration tab and select *Storage Adapters*. Select the iSCSI Software Adapter and click *Rescan*. The newly created iSCSI target and LUN should be visible from the ESX server.

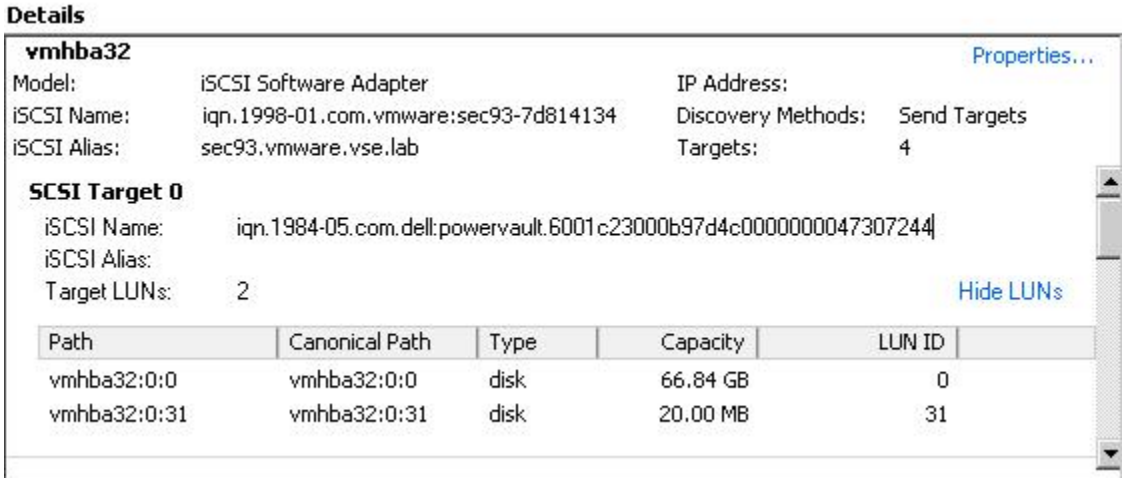


Figure 15: iSCSI target and LUNs as visible through VI client

NOTE: LUN 31 is the Management LUN of the Dell MD3000 and Dell MD3000i Storage Devices. Additional info can be found at:
http://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displayKC&externalId=1004069

2. Go to the configuration tab and select *Storage*.
3. Click on *Add Storage*, select *Disk/Lun* and click *Next*.
4. Select the newly added storage and click *Next*.
5. Select the newly created iSCSI LUN and click *Next*.
6. Review the disk layout and click *Next.*
7. Provide *a* name for the VMFS datastore and cl*ick Next.*
8. Select the appropriate block size and capacity for the VMFS datastore and click *Next.*
9. Review the disk layout and click *Finish* to create the VMFS datastore. The new datastore is now ready to be used for storing virtual machine images.

8. NX1950 Introduction

Dell™ PowerVault™ NX1950 is a unified network storage solution that simultaneously stores both file and application data while supporting a wide range of operating environments and communication protocols, including the iSCSI standard**.** The PowerVault NX1950 can be deployed as an integrated solution (Basic and High Availability configuration) packaged with a Dell PowerVault MD3000 Storage Array or as a Gateway connecting directly to existing Dell|EMC SAN. However, ESX only supports a subset of the available solutions for the PowerVault NX1950.

This document provides instructions to setup an *NX1950 Integrated Basic Configuration* to provide iSCSI storage for usage with VMware ESX Server software. The PowerVault NX1950 integrated basic storage solution consists of single-node configuration running Microsoft® Windows® Unified Data Storage Server (WUDSS) 2003 operating system and is pre-configured from Dell with a PowerVault MD3000 Storage Array.

Note: The Dell PowerVault NX1950 is supported only in integrated basic configuration with VMware ESX using only the iSCSI protocol and not NFS. NX1950 is not supported in Integrated High Availability configuration with VMware ESX.

The Microsoft iSCSI software target functionality included as part of WUDSS uses the Windows TCP/IP network stack on NX1950 to provide block storage services to ESX server. The Microsoft iSCSI software target creates storage devices as iSCSI virtual disks, which are files in the virtual hard disk (VHD) format. These iSCSI virtual disks are assigned to specific iSCSI targets. Only the iSCSI virtual disks assigned to an iSCSI target (exported to the iSCSI target) are available to the iSCSI initiator running as part of VMware ESX server or inside a virtual machine. This storage can be used by ESX server to create VMFS datastores or used directly by virtual machines as block storage. This section covers NX1950 deployment instructions using the iSCSI initiator within VMware ESX/ESXi. For instructions on using an iSCSI initiator inside a virtual machine, refer to your specific initiator and guest operating system documentation.

9. NX1950 Reference Solution

The following figure illustrates a typical setup for using NX1950 in an ESX Server farm. As a best practice, Dell recommends using dedicated Gigabit Ethernet network to handle iSCSI storage traffic.

Note: The Dell PowerVault NX1950 is supported only in integrated basic configuration with VMware ESX using only the iSCSI protocol and not NFS. NX1950 is not supported in Integrated High Availability configuration with VMware ESX.

ESX Host Servers attached to Single Node NX1950i

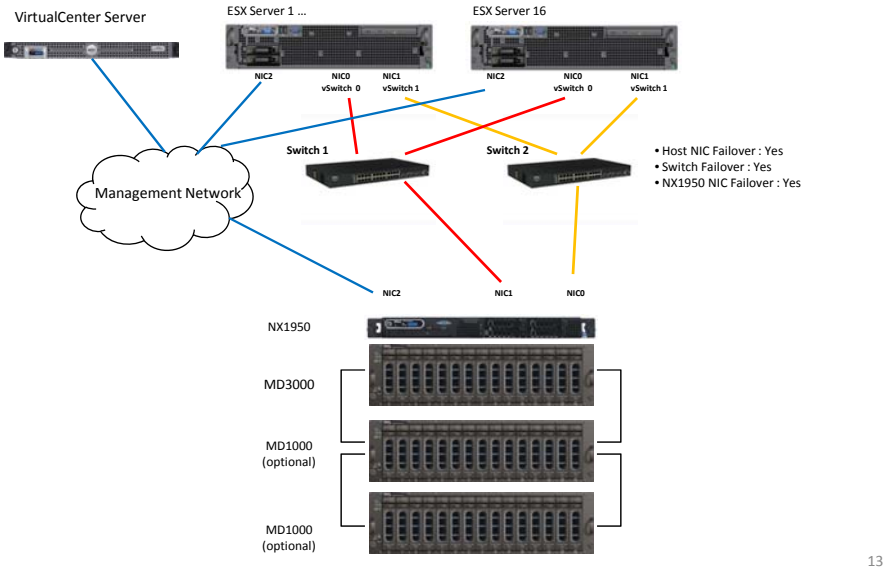


Figure 16: Typical NX1950 storage solution architecture for VMware ESX Server

10. NX1950 storage setup and configuration

For information on storage configuration on NX1950, refer to NX1950 Deployment Guide at http://support.dell.com/.

Select interface for storage requests: On the NX1950 server, open the Microsoft iSCSI Software Target console and select the appropriate network to service storage requests.

1. Open the Microsoft iSCSI Target Software from *Start->Administrative Tools->Microsoft iSCSI Software Target*
2. Right click on *Microsoft iSCSI Software Target* and click on *Properties*
3. Select the appropriate network interface to service storage requests.

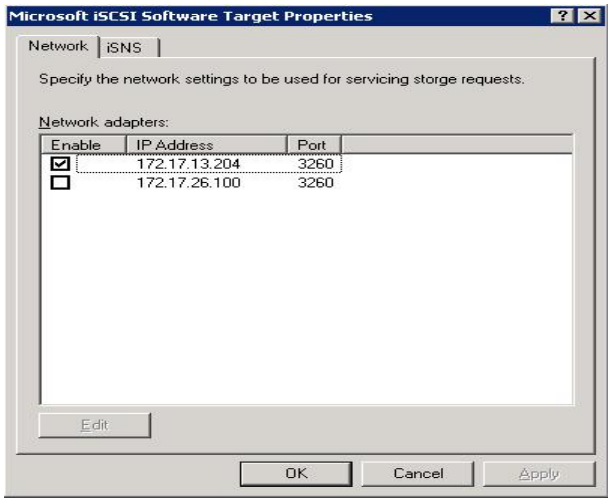


Figure 17: Network selection to serve storage requests

Note: Teaming of network ports that serve iSCSI storage requests on the NX1950 target system is not supported.

11. NX1950 iSCSI Software Initiator Configuration on ESX Server

This section lists the steps required to configure the software initiator on the VMware ESX Server. Connect to the ESX server/VirtualCenter using VI Client, and follow the below steps:

1. Select *Configuration->Storage Adapters* on the ESX server
2. Select iSCSI software adapter and click on *Properties.* The iSCSI initiator Properties window appears.

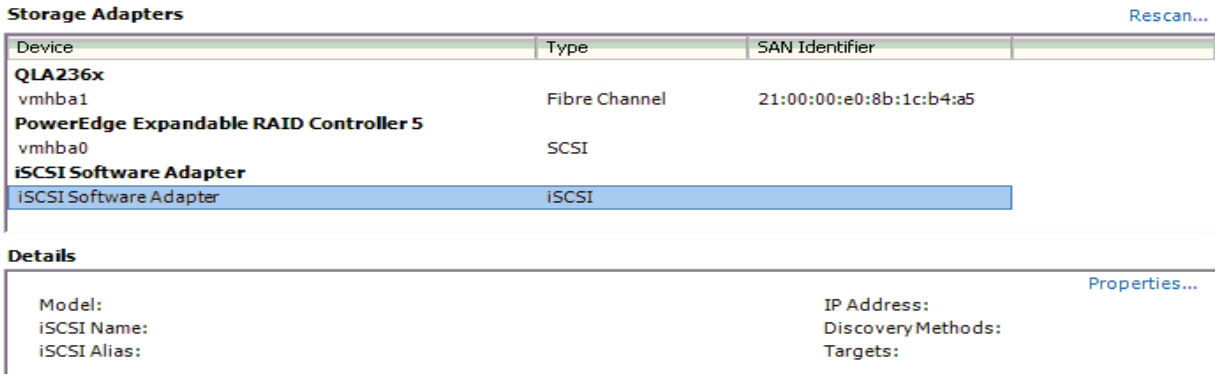


Figure 18: iSCSI software initiator tab on VI client

3. Under the general tab select Configure tab. Select the Enabled checkbox and click OK. Select Close.

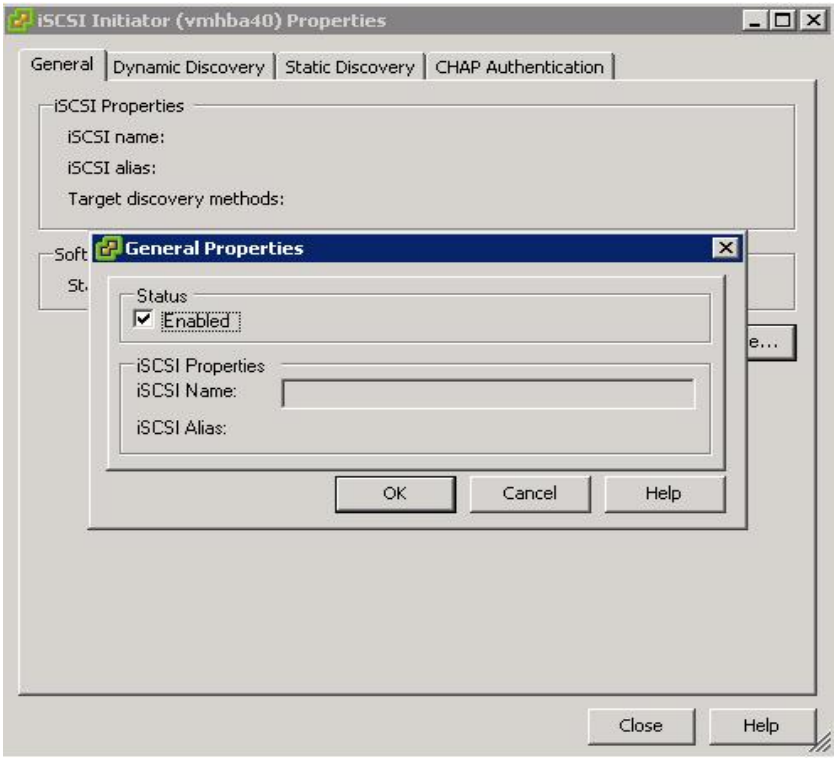


Figure 19: iSCSI software initiator properties window

4. Select iSCSI software adapter under storage. You should now see your iSCSI Target name listed.

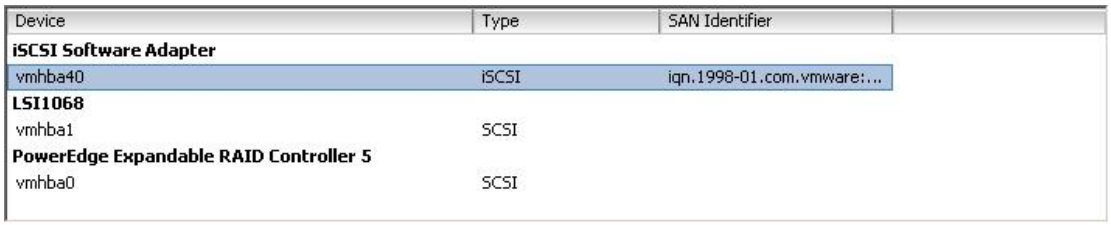


Figure 20: iSCSI software initiator after initial configuration

5. Select Properties under storage adapters. Select Dynamic Discovery. Select *Add*. Provide the IP address of the bridge configured on NX1950 and click OK.

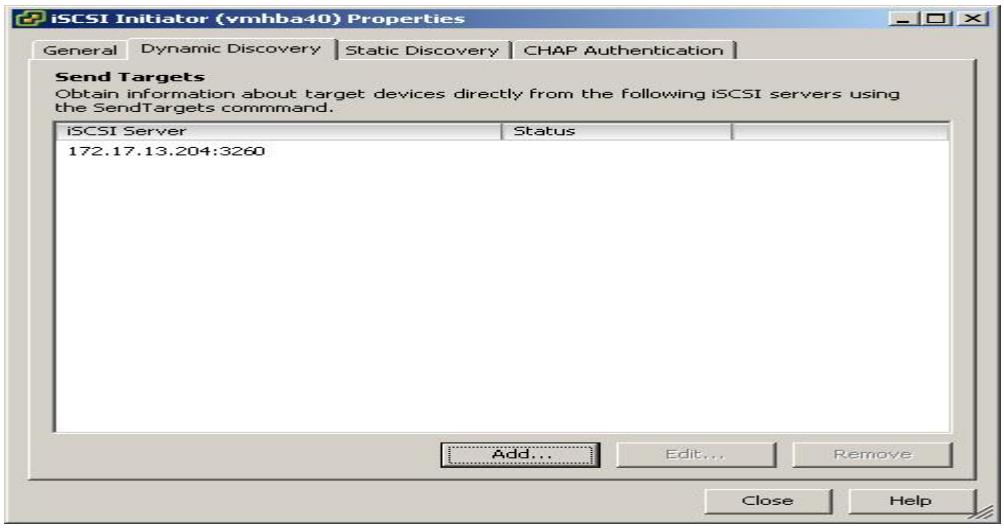


Figure 21: iSCSI software initiator properties window

6. Click *Close*.

12. iSCSI Target and Virtual Disk Configuration on NX1950

a. Create iSCSI Target

Follow the below steps to create an iSCSI target on the NX1950. Open the Microsoft iSCSI Target Software from *Start->Administrative Tools->Microsoft iSCSI Software Target*

1. Right click *iSCSI Targets* and select *Create iSCSI target*. Welcome to create iSCSI Target screen appears. Select Next.
2. Create iSCSI Target: Provide a name and description for the iSCSI and select *Next*.

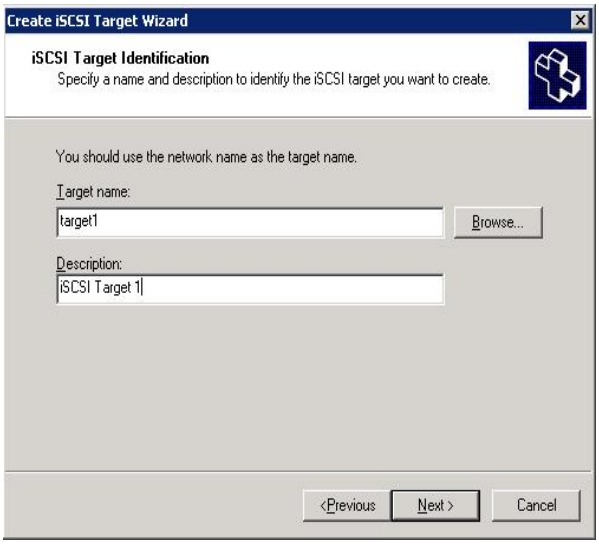

Create iSCSI Target Wizard
iSCSI Target Identification
Specify a name and description to identify the iSCSI target you want to create.
You should use the network name as the target name.
Target name:
target1
Browse...
Description:
iSCSI Target 1
<Previous
Next >
Cancel

Figure 22: iSCSI target creation wizard

3. Identify iSCSI Initiator: Select the iSCSI initiator IQN name from the ESX Server host. Select Next to continue. For a new initiator, type in the IQN.

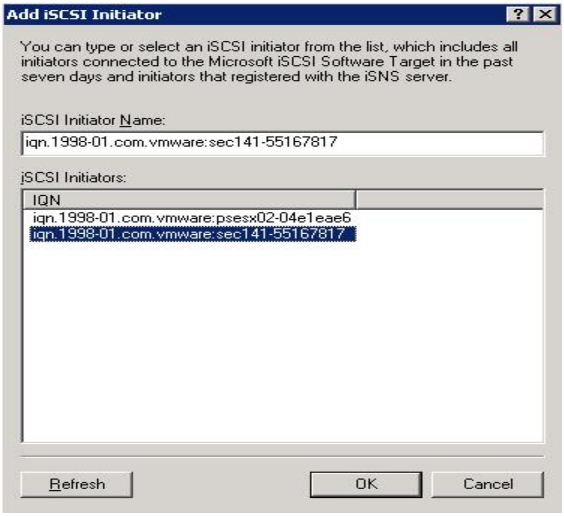

Add iSCSI Initiator
You can type or select an iSCSI initiator from the list, which includes all initiators connected to the Microsoft iSCSI Software Target in the past seven days and initiators that registered with the iSNS server.
iSCSI Initiator Name:
iqn.1998-01.com.vmware:sec141-55167817
iSCSI Initiators:
IQN
iqn.1998-01.com.vmware:psesx02-04e1eae6
iqn.1998-01.com.vmware:sec141-55167817
Refresh
OK
Cancel

Figure 23: iSCSI initiator selection wizard

4. Select *Finish* to complete the target creation.

b. Create Virtual Disks

1. Right click newly created iSCSI target and select *Create Virtual Disk for iSCSI Target*. The Create Virtual Disk Wizard appears next.
2. Create virtual disk: The virtual disk is created as a file residing on a formatted storage volume (preferably formatted as an NTFS file system volume). On the Create Virtual Disk Wizard, browse to this partition and specify a name for the virtual disk. Select *Next*.

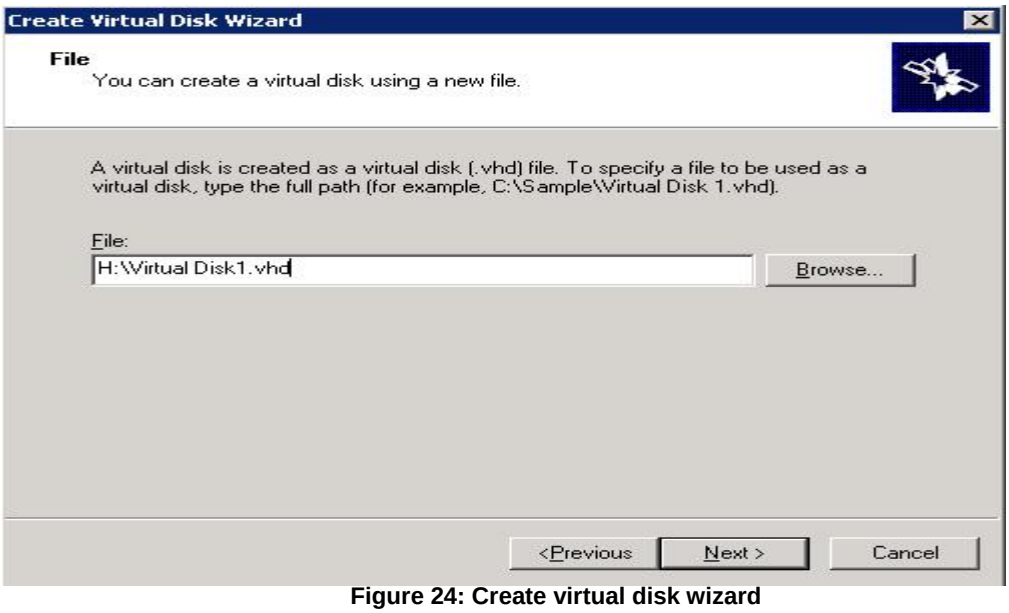

Create Virtual Disk Wizard
File
You can create a virtual disk using a new file.
A virtual disk is created as a virtual disk (.vhd) file. To specify a file to be used as a virtual disk, type the full path (for example, C:\Sample\Virtual Disk 1.vhd).
File:
H:\Virtual Disk1.vhd
Browse...
<Previous
Next >
Cancel

Figure 24: Create virtual disk wizard

3. Specify the size (in MB) of the virtual disk and click *Next*.
4. Provide a description for the virtual disk and click *Next.*
5. Specify the iSCSI target that you want to attach the virtual disk to. Select the newly created iSCSI target name and click *Add*. Click *OK and* then click *Next* and then *Finish* to complete creation of virtual disk.
6. The iSCSI target should now appear under iSCSI targets and the virtual disk should show with status as idle.

13. Configure NX1950 iSCSI storage on ESX Server

Connect to the ESX Server/VirtualCenter using VI Client and follow the steps below.

1. Go to the configuration tab and select *Storage Adapters*. Select the iSCSI Software Adapter and click *Rescan*. The newly created iSCSI target and LUN should be visible from the ESX server. The status of the virtual disk as shown on NX1950 Microsoft iSCSI target software should now show as *"In Use."*

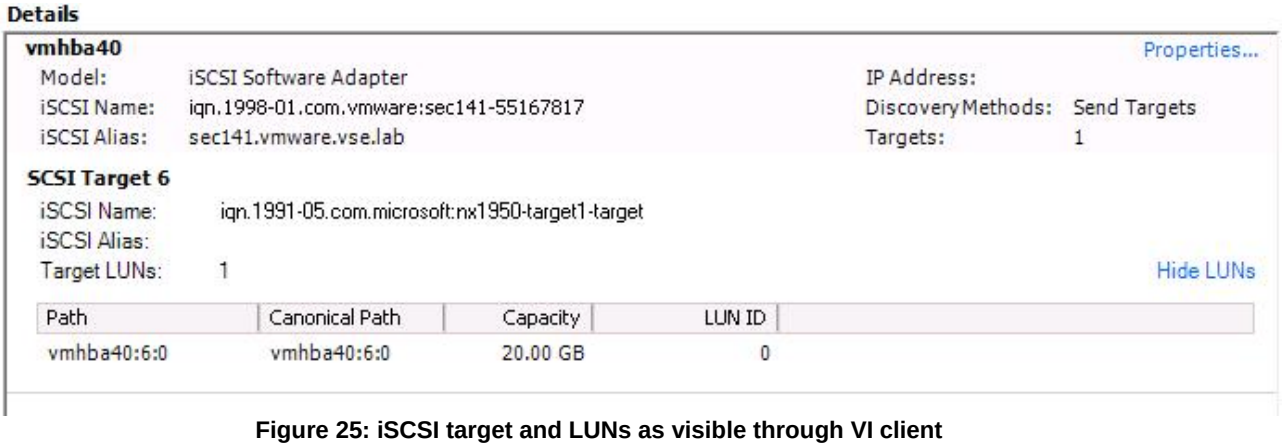


Figure 25: iSCSI target and LUNs as visible through VI client

Note: The NX950 will have one LUN target per IQN connection as opposed to MD3000i which has multiple LUNs under a single IQN.

2. Go to the configuration tab and select *Storage*. Click on *Add Storage*, select *Disk/Lun* and click *Next*. Select the newly added storage and click *Next*.
3. Select the newly created iSCSI LUN and click *Next*.
4. Review the disk layout and click *Next.*
5. Provide a name for the VMFS datastore and click *Next.*
6. Select the appropriate block size and capacity for the VMFS datastore and click *Next.*
7. Review the disk layout and click *Finish* to create the VMFS datastore. The new datastore is now ready to be used for storing virtual machine images.

Section 2: Dell Direct Attached Storage Arrays

14. MD3000 Introduction

The Dell™ PowerVault™ MD3000 direct-attached storage array consists of a standard configuration that can support up to four servers. The Dell PowerVault MD3000 storage array can support dual controllers with dual SAS “IN” connectors.

Setting up the MD3000 storage solution for usage with VMware® ESX 3.5/3.5i™ software is straightforward. Using a Dell SAS5/E HBA in a Dell PowerEdge server running VMware ESX/ESXi 3.5, the storage array will be directly exposed to the attached host servers. The only thing to configure is the MD3000 using MD Storage Manager (MDSM).

For more information on configuring the MD3000, please refer to the installation guide at: http://support.dell.com/support.

NOTE: Only basic connectivity is supported on the MD3000 in an ESX environment. There is no support for failover.

15. MD3000 Reference Configuration

The following figure illustrates a supported configuration for the MD3000 with ESX.

15.1 MD3000 with up to Four Hosts with Non-Redundant Data Paths

In this configuration, up to 4 VMware ESX servers are connected to the MD3000 via SAS5/E HBAs. One SAS5/E HBA port from each server is connected to the MD3000 controller data port. Up to two additional MD1000 enclosures can be daisy-chained to the MD3000.

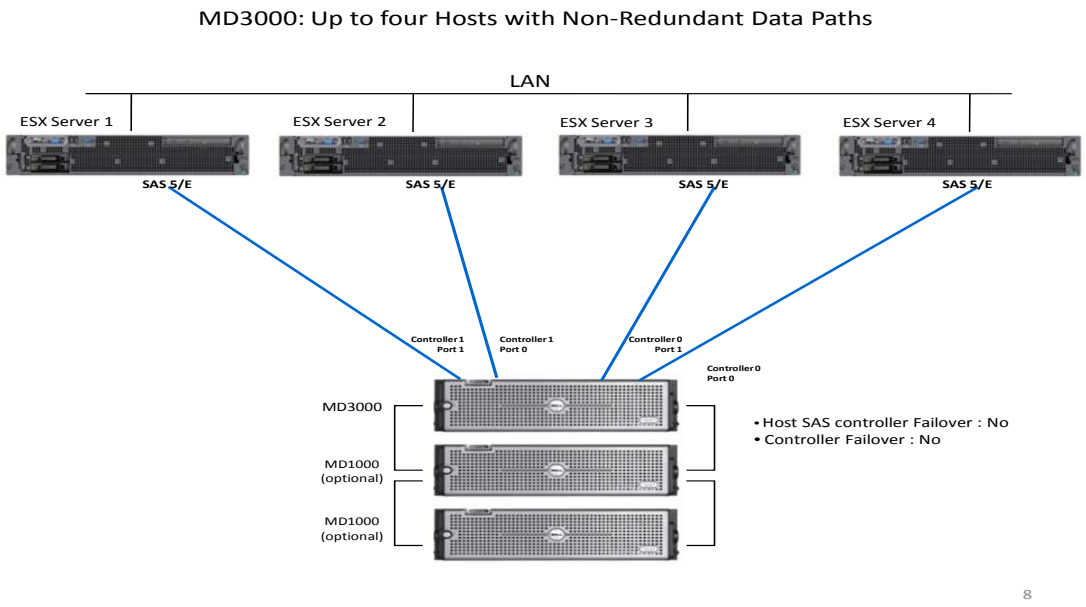


Figure 26: MD3000 with up to Four Hosts with Non-Redundant Data Paths

16. MD1000 Introduction

The Dell™ PowerVault™ MD1000 direct-attached storage array consists of a standard configuration that supports one server.

Setting up the MD1000 storage solution for usage with VMware® ESX 3.5/3.5i™ software is straightforward. Using a Dell PERC5e/PERC6e in a Dell PowerEdge server running VMware ESX/ESXi 3.5, the storage array will be directly exposed to the attached host servers. The MD1000 can be configured during boot or via OMSS.

For more information on configuring the MD1000, please refer to the installation guide at: http://support.dell.com/support.

17. MD1000 Reference Configuration

The following figure illustrates a supported configuration for the MD1000 with ESX.

17.1 MD1000 Unified Mode

In this configuration, one VMware ESX server is connected to the MD1000 via a Dell PERC5e/6e.

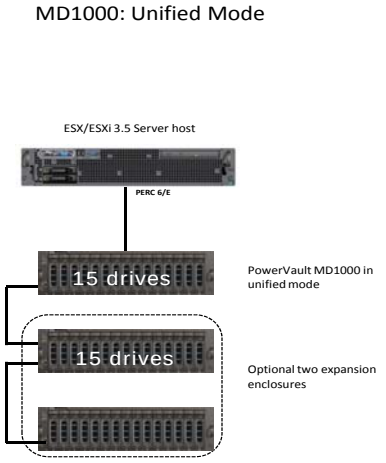


Figure 26: MD1000 Unified Mode

18. References

1. Dell | VMware alliance home page: www.dell.com/vmware
2. Dell PowerVault MD3000i support documents: http://support.dell.com/support/edocs/systems/md3000i/
3. Drivers download page for MD3000i: http://support.dell.com/support/downloads/driverslist.aspx?c=us&cs=555&l=en&s=biz&ServiceTag=&SystemID=PWV_MD3000I&os=NAA&osl=EN
4. VMware Virtual Infrastructure 3 Documentation: http://www.vmware.com/support/pubs/vi_pubs.html
5. VMware iSCSI SAN Configuration Guide: http://www.vmware.com/pdf/vi3_35/esx_3/r35/vi3_35_25_iscsi_san_cfg.pdf
6. Dell PowerVault MD3000 support documents: http://support.dell.com/support/edocs/systems/md3000/
7. Drivers download page for MD3000: http://support.dell.com/support/downloads/driverslist.aspx?os=NAA&osl=EN&catid=-1&impid=-1&servicetag=&SystemID=PWV_MD3000&hidos=LHS64&hidlang=enDell
8. PowerVault NX1950 support documents: http://support.dell.com/support/edocs/software/PVNX1950/
9. Drivers download page for NX1950: http://support.dell.com/support/downloads/driverslist.aspx?os=WX64&osl=EN&catid=-1&impid=-1&servicetag=&SystemID=PWV_NX_1950&hidos=WNET&hidlang=en
10. PowerVault MD1000 support documents: http://support.dell.com/support/edocs/systems/md1000/
11. Drivers download page for MD1000: http://support.dell.com/support/downloads/driverslist.aspx?c=us&l=en&s=gen&ServiceTag=&SystemID=PWV_MD1000&os=WNET&osl=en&catid=&impid=
12. Microsoft Widows Unified Storage Data Storage Server: http://www.microsoft.com/windowsserversystem/storage/wudss.mspx

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